

Progress on the EBIS charge breeder system of RAON in Korea

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A rare isotope beam facility called RAON is under design and construction in Korea and will facilitate an ISOL system to produce rare isotopes using a proton beam accelerated from commercial cyclotron. The ISOL system will include an ISOL target, laser ion source, pre-separator, RFQ-cooler/buncher, and EBIS charge breeder. The charge-bread isotope beam extracted from EBIS will be post-accelerated by a superconducting linear accelerator. An EBIS system has been designed in beam optics using TRAK and PBGUN [1]. Mechanical design was followed along with thermo-mechanical analysis. The maximum electron beam current is set to be 3 A at 20 kV, and the maximum magnetic field in the trap region is 6 T. An electron collector which can handle up to 20 kW has been designed and will be constructed in this year. An electron gun assembly employing an IrCe cathode was procured from BINP and has been tested. The test results of the electron gun and overall progress of the EBIS system will be presented.

References

- [1] Jongwon Kim *et al.*, “An EBIS system for Rare Isotope Science Project in Korea” in Proceedings of the XII International Symposium on Electron Beam Ion Sources and Traps, AIP Conf. Proc. 1640, 38-43 (2015).